

Student Name: \_\_\_\_\_



# Missouri

Missouri Department of Elementary and Secondary Education

## End-of-Course Assessment

### Geometry



Released 2009



**RIVERSIDE  
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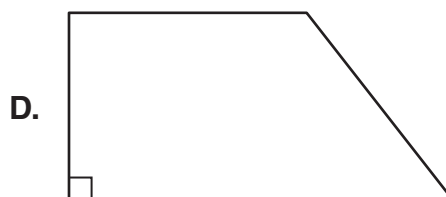
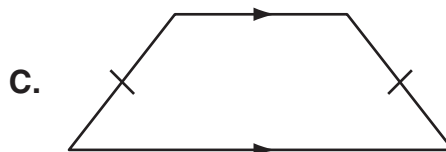
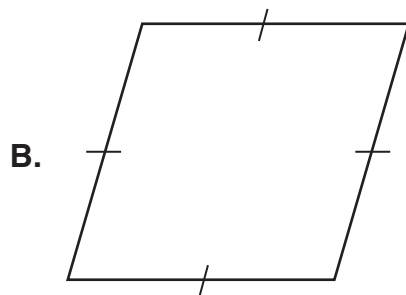
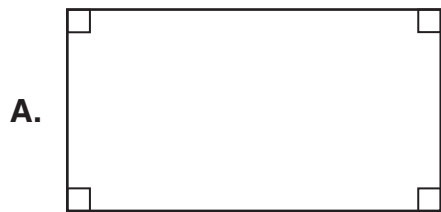
**Directions to the Student**

Today you will be taking the Missouri Geometry Test. This is a test of how well you understand the course level expectations for Geometry.

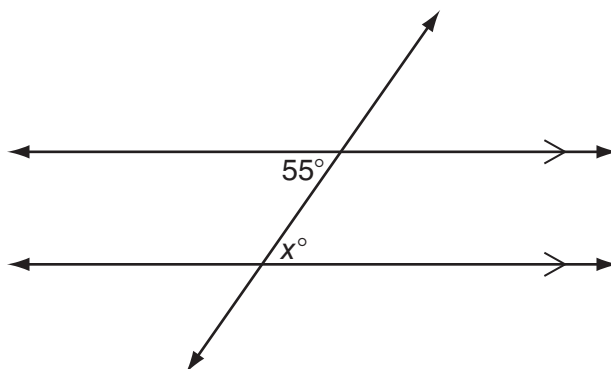
**There are several important things to remember:**

- 1** Read each question carefully and think about the answer. Then choose the one answer that you think is best.
- 2** Make sure you completely fill in the bubble for the answer on your answer sheet with a number 2 pencil.
- 3** If you do not know the answer to a question, skip it and go on. You may return to it later if you have time.
- 4** If you finish the test early, you may check over your work.
- 5** Do NOT write any answers in your test booklet. Mark your answers directly on your answer sheet with a number 2 pencil.

1. Which shape does *not* have any lines of symmetry?



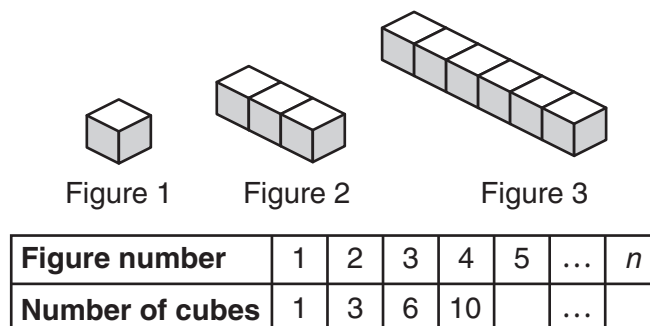
2. The lines shown below are parallel.



What is the value of  $x$ ?

- A. 35
- B. 55
- C. 110
- D. 125

3. Which of these expressions represents the pattern for the number of cubes in figure  $n$ ?



- A.  $\frac{n(n+1)}{2}$   
 B.  $\frac{n(n+2)}{2}$   
 C.  $n(n+1)$   
 D.  $n(n+2)$

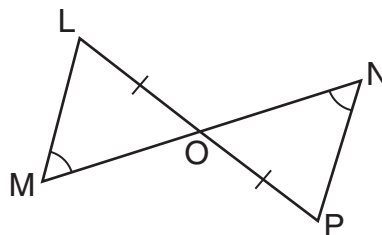
4. Given:  $\overline{AB}$  with coordinates of  $A(-3, -1)$  and  $B(2, 1)$   
 $\overline{A'B'}$  with coordinates of  $A'(-1, 2)$  and  $B'(4, 4)$

Which translation was used?

- A.  $(x, y) \rightarrow (x+2, y+3)$   
 B.  $(x, y) \rightarrow (x+2, y-3)$   
 C.  $(x, y) \rightarrow (x-2, y+3)$   
 D.  $(x, y) \rightarrow (x-2, y-3)$

5. Given:  $\angle M \cong \angle N$ ,  $\overline{LO} \cong \overline{PO}$

Prove:  $\triangle MOL \cong \triangle NOP$

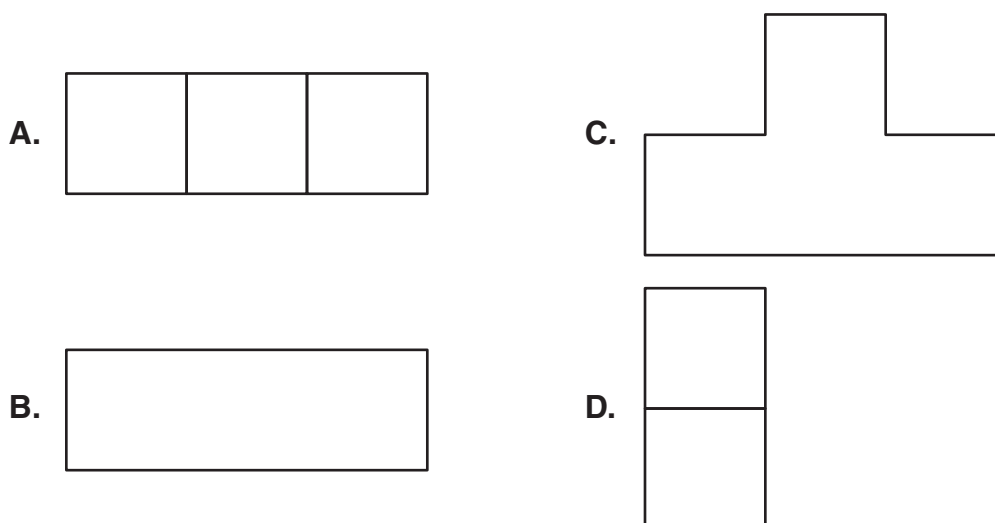
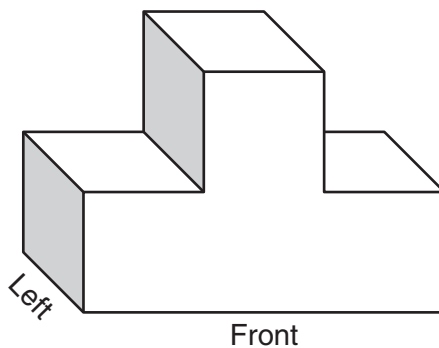


Statements	Reasons
1) $\angle M \cong \angle N$	1) Given
2) $\overline{LO} \cong \overline{PO}$	2) Given
3) $\angle MOL \cong \angle NOP$	3) _____
4) $\triangle MOL \cong \triangle NOP$	4) AAS

Which of these reasons would be appropriate for statement 3?

- A. reflexive property
- B. definition of midpoint
- C. Vertical angles are congruent.
- D. Corresponding parts of congruent triangles are congruent.

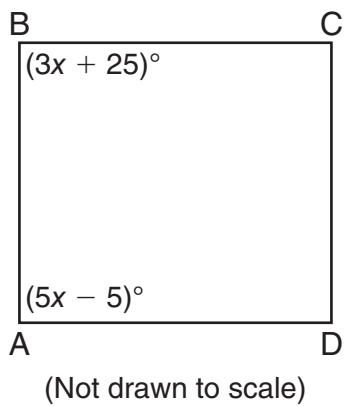
6. Which diagram shows the top view of the solid below?



7. Which statement is true about an equilateral triangle?

- A. It has no rotational symmetry.
- B. It has only rotational symmetry.
- C. It has exactly 1 line of symmetry.
- D. It has exactly 3 lines of symmetry.

8. Parallelogram ABCD is shown below.

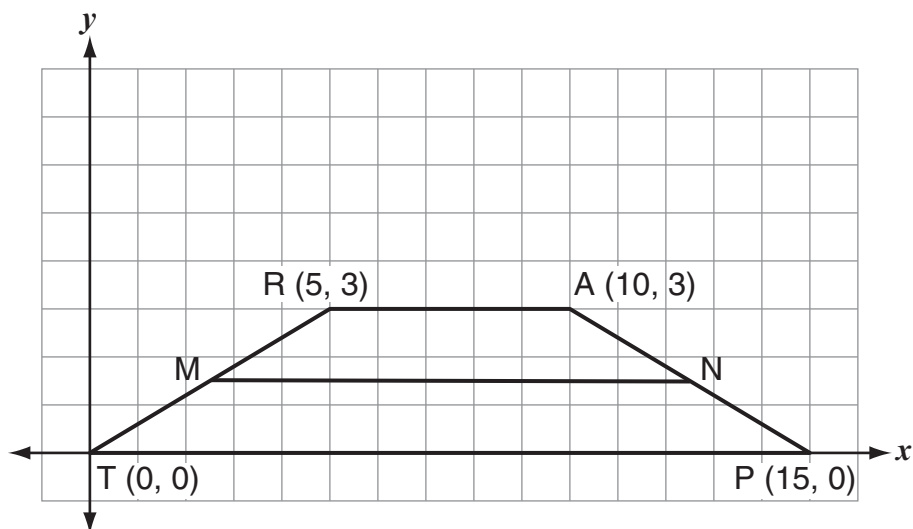


What is the measure of  $\angle ABC$ ?

- A.  $85^\circ$
- B.  $90^\circ$
- C.  $95^\circ$
- D.  $100^\circ$



9. Trapezoid TRAP is shown below.



What is the length of midsegment MN?

- A. 10
- B.  $\frac{25}{2}$
- C.  $\sqrt{234}$
- D. 100

**10. Look at the letters below.**

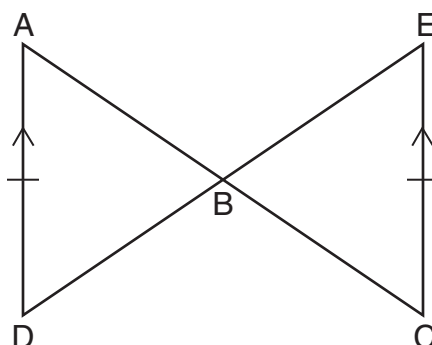
**COIVHTME**

**How many letters have a horizontal line of symmetry?**

- A. 3**
- B. 5**
- C. 6**
- D. 8**

11. Given:  $\overline{AD} \parallel \overline{EC}$ ,  $\overline{AD} \cong \overline{EC}$

Prove:  $\overline{AB} \cong \overline{CB}$



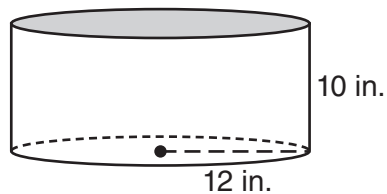
Shown below are the statements and reasons for the proof. They are not in the correct order.

Statement	Reason
I. $\triangle ABD \cong \triangle CBE$	I. AAS
II. $\angle ABD \cong \angle EBC$	II. Vertical angles are congruent.
III. $\overline{AD} \parallel \overline{EC}$ , $\overline{AD} \cong \overline{EC}$	III. Given
IV. $\overline{AB} \cong \overline{CB}$	IV. Corresponding parts of congruent triangles are congruent.
V. $\angle DAB \cong \angle ECB$	V. If two parallel lines are cut by a transversal, the alternate interior angles are congruent.

Which of these is the most logical order for the statements and reasons?

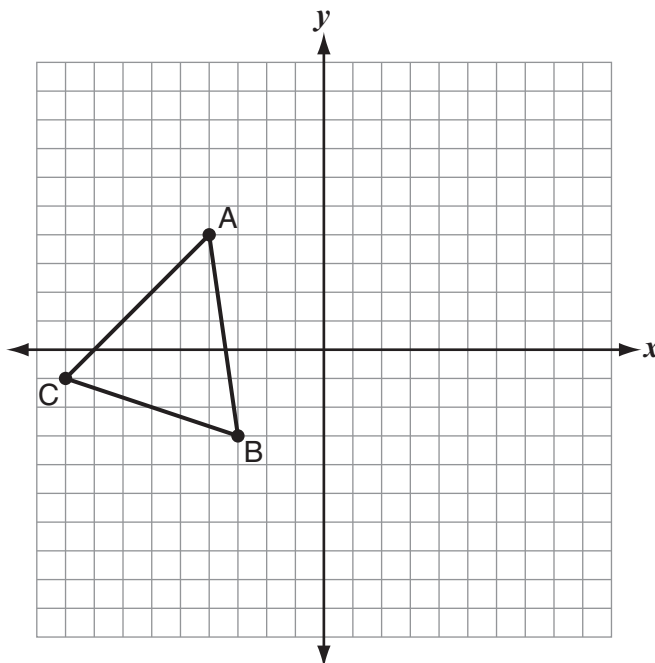
- A. I, II, III, IV, V
- B. III, II, V, I, IV
- C. III, II, V, IV, I
- D. II, V, III, IV, I

12. What is the volume of the right cylinder below, in terms of  $\pi$ ?



- A.  $120\pi$  cubic inches
- B.  $240\pi$  cubic inches
- C.  $1,200\pi$  cubic inches
- D.  $1,440\pi$  cubic inches

13.  $\triangle ABC$  with vertices at  $A(-4, 4)$ ,  $B(-3, -3)$ , and  $C(-9, -1)$  is rotated  $180^\circ$  counterclockwise about the origin.



What are the vertices of the image,  $\triangle A'B'C'$ ?

- A.  $A'(-4, 4)$ ,  $B'(-3, -3)$ ,  $C'(-9, -1)$
- B.  $A'(4, -4)$ ,  $B'(-3, -3)$ ,  $C'(-1, -9)$
- C.  $A'(4, -4)$ ,  $B'(3, 3)$ ,  $C'(9, 1)$
- D.  $A'(4, 4)$ ,  $B'(3, -3)$ ,  $C'(9, -1)$

14. Which table of values represents the line with the equation  $y = \frac{2}{3}x + 3$ ?

**A.**

$x$	$y$
0	3
2	6
4	9

**C.**

$x$	$y$
-3	1
0	3
3	5

**B.**

$x$	$y$
1	-3
2	$-\frac{3}{2}$
3	0

**D.**

$x$	$y$
0	3
1	$\frac{5}{3}$
2	$\frac{7}{3}$

15. Mr. Smith and Ms. Jones start at the same place. Mr. Smith drives north for 4 miles. Ms. Jones drives east for 5 miles. What is the direct distance between Mr. Smith and Ms. Jones?



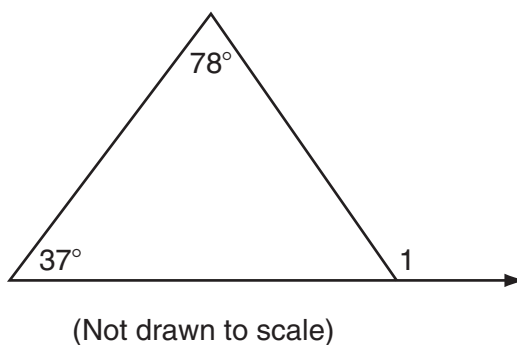
- A.  $\sqrt{18}$  miles
- B.  $\sqrt{41}$  miles
- C. 9 miles
- D. 41 miles

16. Given:  $\overleftrightarrow{XY}$  and  $\overleftrightarrow{ZW}$  intersect at point A.

Which conjecture is *always* true about the given statement?

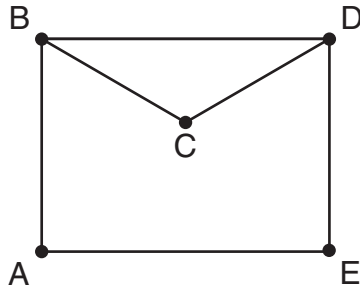
- A.  $XA = AY$
- B.  $\angle XAZ$  is acute.
- C.  $\overleftrightarrow{XY}$  is perpendicular to  $\overleftrightarrow{ZW}$ .
- D. X, Y, Z, and W are noncollinear.

17. What is the measure of  $\angle 1$  in the figure below?



- A.  $41^\circ$
- B.  $65^\circ$
- C.  $102^\circ$
- D.  $115^\circ$

18. As a classroom warm-up problem, Ms. Hughes drew this network and asked her students to write down the path that showed traceability.



Which response shows the traceable path?

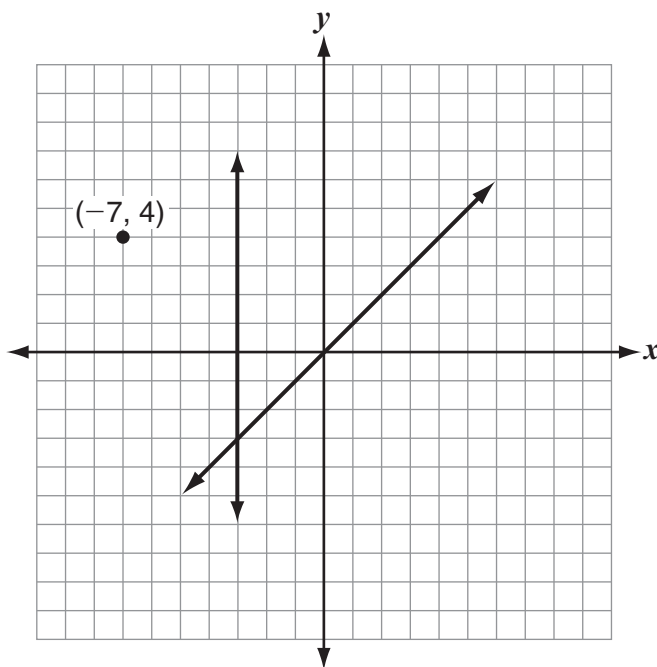
- A.  $\overline{CB}$ ,  $\overline{BA}$ ,  $\overline{AE}$ ,  $\overline{ED}$ ,  $\overline{CD}$
  - B.  $\overline{BC}$ ,  $\overline{CD}$ ,  $\overline{DE}$ ,  $\overline{EA}$ ,  $\overline{AB}$ ,  $\overline{BD}$
  - C.  $\overline{AB}$ ,  $\overline{BC}$ ,  $\overline{CD}$ ,  $\overline{DE}$ ,  $\overline{AE}$ ,  $\overline{AB}$ ,  $\overline{DB}$
  - D.  $\overline{AE}$ ,  $\overline{ED}$ ,  $\overline{DB}$ ,  $\overline{BC}$ ,  $\overline{CD}$ ,  $\overline{BD}$ ,  $\overline{BA}$
19. Look at the conditions below.
- 1. If a quadrilateral has four right angles, then it is a rectangle.
  - 2. If a quadrilateral is a rectangle, then it could be a square.
  - 3. Quadrilateral ABCD has four right angles.
- Using these conditions, which of these is a valid conclusion?
- A. Quadrilateral ABCD must be a square.
  - B. Quadrilateral ABCD is not a rectangle.
  - C. Quadrilateral ABCD could be a square.
  - D. Quadrilateral ABCD could be a rectangle.



20. What is the  $y$ -intercept of the equation  $3x - 2y = 24$ ?

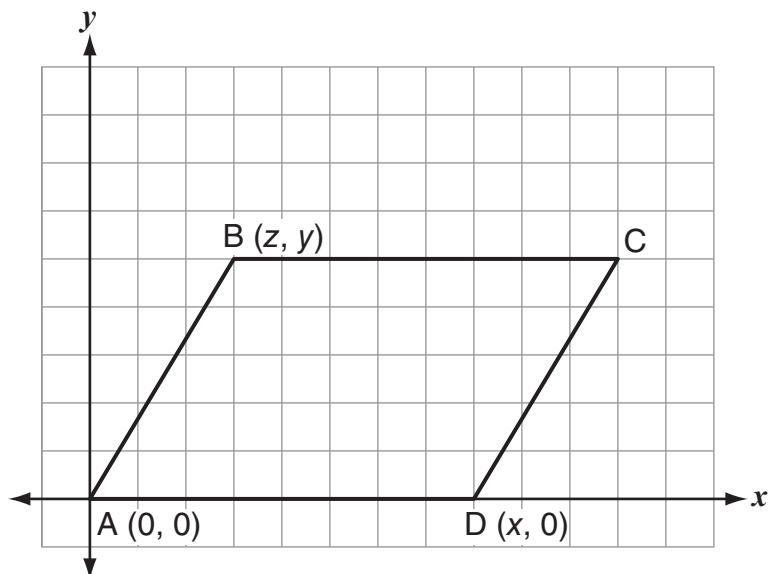
- A.  $(0, -12)$
- B.  $(0, -8)$
- C.  $(0, 8)$
- D.  $(0, 12)$

21. The point  $(-7, 4)$  is reflected over the line  $x = -3$ . Then, the resulting point is reflected over the line  $y = x$ . Where is the point located after both reflections?



- A.  $(-10, -7)$
- B.  $(1, 4)$
- C.  $(4, -7)$
- D.  $(4, 1)$

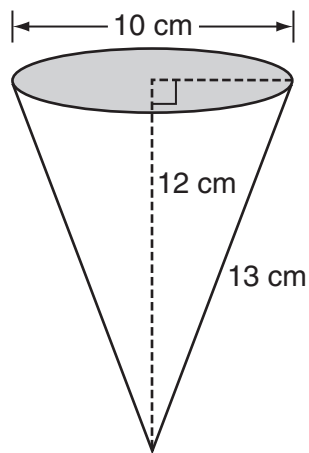
22. Parallelogram ABCD is graphed on the coordinate plane shown below.



What are the coordinates of point C?

- A.  $(x, y)$
- B.  $(y, x + z)$
- C.  $(x + z, y)$
- D.  $(x - z, y)$

23. An ice cream company needs to know how much ice cream can fit into its new ice cream cones.

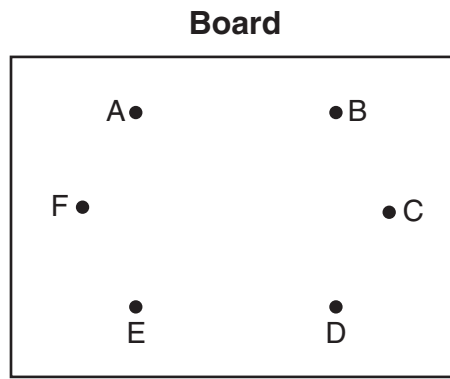


(Not drawn to scale)

Using 3.14 for  $\pi$ , approximately how much ice cream will fill the cone level with the top?

- A.  $188 \text{ cm}^3$
- B.  $314 \text{ cm}^3$
- C.  $340 \text{ cm}^3$
- D.  $942 \text{ cm}^3$

24. A network of electrical wires will be constructed so that each of the six points on the board is directly connected to each other point by a piece of wire. The diagram shows the board with points A, B, C, D, E, and F.



How many pieces of wire are needed to make the network?

- A. 6
- B. 10
- C. 15
- D. 30

25. The table shows prices for different numbers of pencils. The price continues to increase in this pattern.

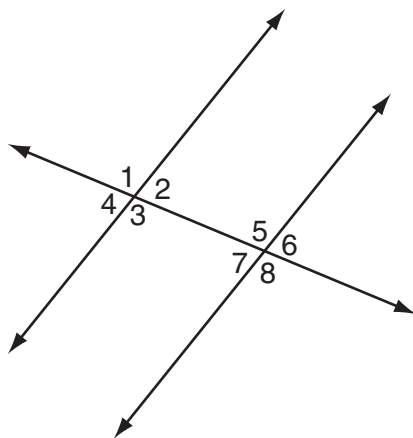
Number of Pencils	Price
5	\$ 0.60
10	\$ 1.20
24	\$ 2.88

$x$  = number of pencils  
 $y$  = total price

Which equation models this situation?

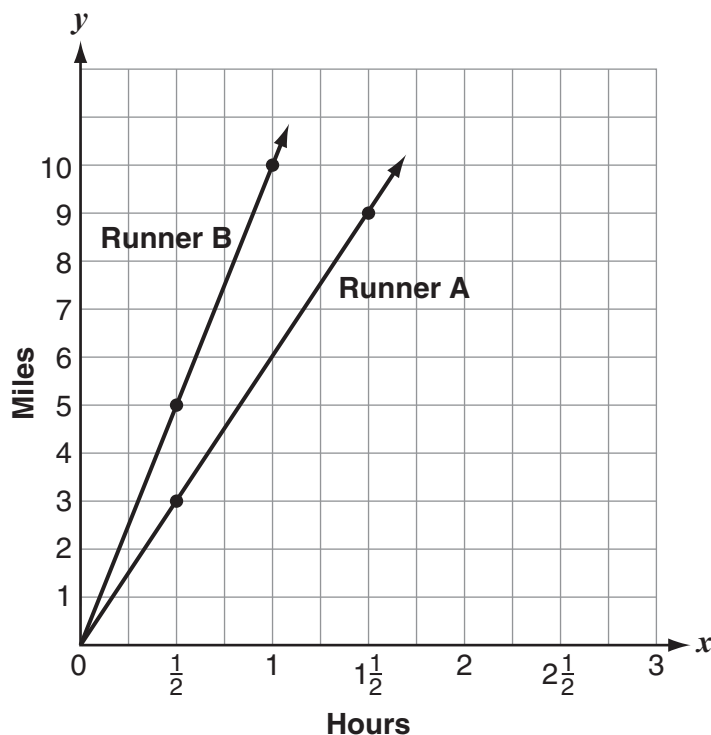
- A.  $y = 0.12x$
- B.  $y = 0.6x$
- C.  $y = 0.12x + 5$
- D.  $y = 0.6x + 5$

26. Given the diagram below, what information is needed to prove that the lines are parallel?



- A.  $m\angle 1 = m\angle 3$
- B.  $m\angle 1 = m\angle 6$
- C.  $m\angle 1 = m\angle 7$
- D.  $m\angle 1 = m\angle 8$

27. The graph below shows the distance, as a function of time, for two runners.



Which runner was faster, and by how much?

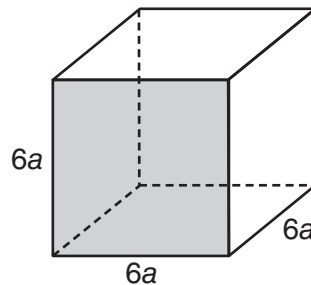
- A. runner A, by 2 miles per hour
- B. runner B, by 2 miles per hour
- C. runner A, by 4 miles per hour
- D. runner B, by 4 miles per hour

28. Kristina plots a triangle with vertices  $(-2, 3)$ ,  $(0, 0)$ , and  $(6, 4)$  on a coordinate plane. If each unit on the coordinate plane represents one meter (m), what is the perimeter of her triangle, to the nearest tenth of a meter?



- A. 11.6 m
- B. 15.3 m
- C. 18.9 m
- D. 22.8 m

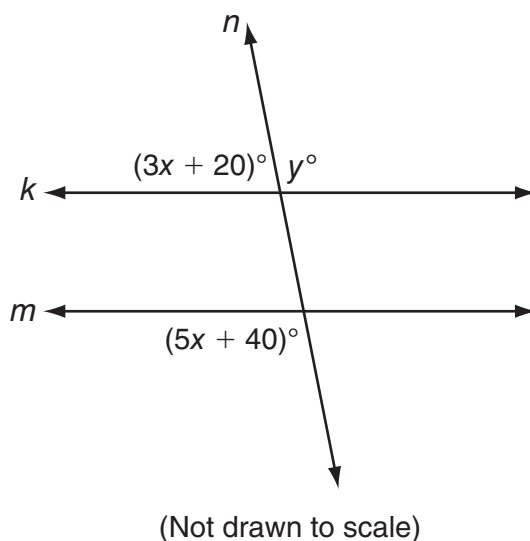
29. What is the volume of the cube shown below?



- A.  $18a$
- B.  $18a^3$
- C.  $216a$
- D.  $216a^3$



30. In the figure below,  $k \parallel m$ .



What is the value of  $y$ ?

- A.  $y = 15$
  - B.  $y = 70$
  - C.  $y = 115$
  - D.  $y = 120$
31. If both of the statements below are true, which statement is a logical conclusion?

Some triangles are isosceles triangles.

All isosceles triangles have two congruent sides.

- A. All triangles have two congruent sides.
- B. Some triangles have two congruent sides.
- C. Some isosceles triangles have three congruent sides.
- D. All figures with two congruent sides are isosceles triangles.

- 32.** Which classification describes  $\triangle MNO$  with vertices  $M(2, -3)$ ,  $N(3, 1)$ , and  $O(-3, 1)$ ?



- A. equilateral
- B. isosceles
- C. right
- D. scalene

- 33.** A family invested \$2,000 into an account that pays 2% interest compounded annually. In the functions below,  $x$  = time in years and  $y$  = total amount in the account after  $x$  years.

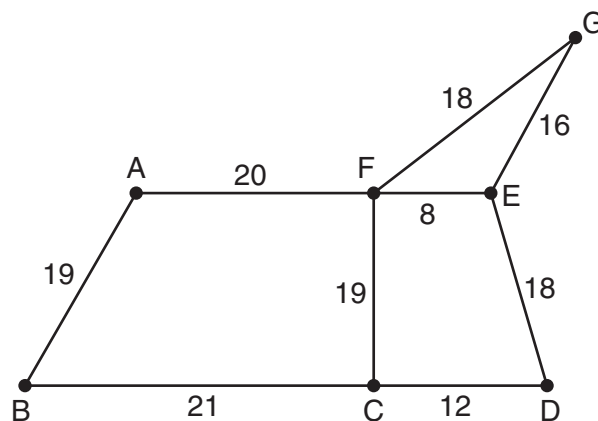
$$y = 40x + 2,000$$

$$y = 2,000(1.02)^x$$

Use the function that models the situation correctly. To the nearest dollar, how much money is in the family's account after 5 years?

- A. \$2,081
- B. \$2,200
- C. \$2,208
- D. \$10,200

34. The numbers in the drawing below represent distance, in miles, between towns.

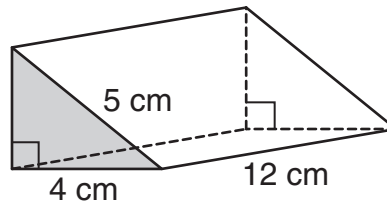


(Not drawn to scale)

If Scott is at Town B, what is the shortest possible route he can take from Town B to Town G if he must travel through Town C?

- A. 57 miles
- B. 58 miles
- C. 64 miles
- D. 70 miles

35. What is the surface area of the solid shown below?



- A.  $72 \text{ cm}^2$
- B.  $144 \text{ cm}^2$
- C.  $156 \text{ cm}^2$
- D.  $184 \text{ cm}^2$

36. Two students started at the coordinate  $(0, 0)$ . Student A walked 7 units east and 5 units south. Student B walked 4 units west and 1 unit south. How many units apart are the students?

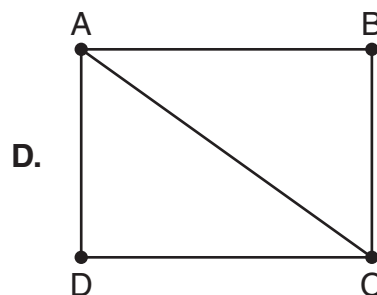
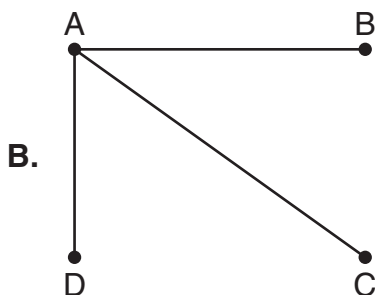
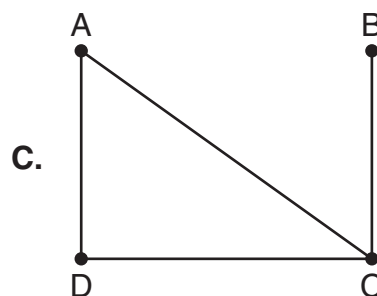
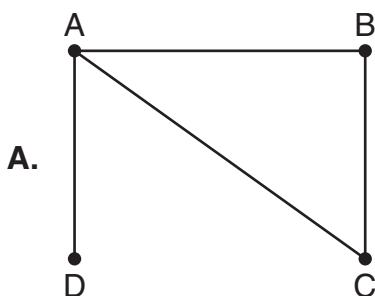


- A. 11
- B.  $\sqrt{137}$
- C.  $\sqrt{153}$
- D.  $\sqrt{157}$

37. A school district has the following high school committee officers.

- Committee A: Amber, Calipso, Juan
- Committee B: Megan, Amber, Sam
- Committee C: Calipso, Sam, Amanda
- Committee D: Jerrad, Roberto, Danielle, Juan

The committees are represented with vertices. If two committees share a person, connect the vertices with an edge. Which graph will allow all committee members to attend the meetings to which they are assigned?



38. The figure below shows a pattern of dots.



Which equation models the number of dots in the  $n$ th term?

$n$  = term number  
 $a_n$  = number of dots  
in the  $n$ th term

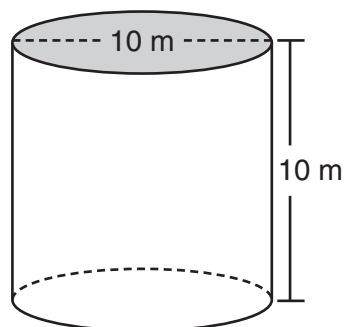
- A.  $a_n = 5n$
- B.  $a_n = 2n + 3$
- C.  $a_n = 2n + 5$
- D.  $a_n = 3n + 2$

39. On a coordinate plane, a shape is plotted with vertices of (3, 1), (0, 4), (3, 7), and (6, 4). What is the area of the shape if each grid unit equals one centimeter?



- A.  $18 \text{ cm}^2$
- B.  $24 \text{ cm}^2$
- C.  $36 \text{ cm}^2$
- D.  $42 \text{ cm}^2$

40. A company makes sealed metal water tanks, as shown below.



To the nearest square meter, how much sheet metal does the company need to make one tank?

- A.  $314 \text{ m}^2$
- B.  $471 \text{ m}^2$
- C.  $785 \text{ m}^2$
- D.  $942 \text{ m}^2$

Released Form